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## How technology facilitates tourism education in COVID-19: case study of Nankai University

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### ABSTRACT

School closures followed the sudden outbreak of COVID-19. In order to minimize the negative impact on learning and teaching, MOOCs, SPOC and live broadcasting have been taken as the responsive measures of universities in China. Taking tourism education of Nankai University as an example, the paper illustrates the operation of distance and online teaching during the epidemic, and analyzes the pros and cons of adopted approaches in order to provide practical reference to online education in other countries as well.

### 1. Introduction

Coronavirus disease 2019 (COVID-19) was first identified in December 2019 (Zhai & Du, 2020), spreading globally and dramatically. The sudden outbreak of the disease has a serious impact on all aspects of university operation especially the teaching and learning. In response to the pandemic, 107 countries had implemented school closures nationwide by March 18, 2020 (Viner et al., 2020). The outbreak of the epidemic has forced all academic staff to seek for effective and technical ways to carry out teaching and learning. In view of the positive side, the COVID-19 also provides an opportunity for teachers to explore and adopt MOOCs, SPOCs, and other online teaching tools and techniques in their teaching and learning.

In line with the guiding principle of "Disrupted classes, Undisrupted Learning" (Huang et al., 2020) from the Chinese Ministry of Education, colleges and universities have to implement protocols and guidelines for classes during school closures. Both tourism industry and tourism education has been enhanced by technology, such as web2.0, virtual reality, and smart classroom. However, there's no evidence which shows that these would work during school closure time. The unparalleled epidemic of COVID-19 provides the opportunity to demonstrate the importance of technology in tourism education. The objectives of the present practice study are to illustrate the integration of different techniques in tourism distance teaching and learning, taking Nankai University as an example; in addition, to explore how technology supported and facilitated the tourism teaching and learning during the outbreak of COVID-19 when all schools are lockdown.

The following issues will be addressed: (1) What are the main approaches adopted, taking Nankai University as an example; (2) what are the strengths and weaknesses of each approach? (3) what are the implications for the future of tourism education?

### 2. Literature review

#### 2.1. The impact of COVID-19 on university education in China

The first case of COVID-19 was identified in December 2019 and it spread across the globe fast. Coronavirus disease 2019 (COVID-

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19) received substantial attention worldwide (Zhai & Du, 2020). The outbreak coincided with the Chinese traditional Spring Festival holiday. Originally after the holiday, students were scheduled to return to school for the new semester. However, the epidemic is too infectious, thus Chinese government formulated strict prevention and control policies and guidelines to ensure the safety as the priority.

In response to COVID-19, China extended the winter holiday and implemented national school closures (Viner et al., 2020) rapidly on January 27, 2020 (Chinese Ministry of Education, 2020). School closures, as part of social distancing actions package, is always assumed as effective and useful measures to reduce social contact among students and thus reducing virus transmission. However, the class was not suspended although the school closures were implemented.

In view of the impact of the COVID-19 on the school reopening, the Ministry of Education of China (2020) issued the guidelines on the organization and management of online teaching in Colleges and Universities during school closures, which requires schools to make full utilization of the online learning resources, and actively carry out online teaching and learning together with other scholarly activities.

The core notion of this policy is to support the teaching and learning with MOOCs, SPOCs, live broadcasting, and other techniques. Until February 2, 2020, more than 24,000 online courses have been opened free of charge on 22 online courses platforms (Ministry of Education of China, 2020). As the concerns for health and safety of students and faculties, school closures keep social distance and reduce the spread of the virus, the actions taken by the Chinese government are highly positive and appreciable.

In order to ensure regular teaching and learning, the colleges and universities encourage and assist teachers to actively utilize online resources to conduct teaching during the extended winter holiday. The outbreak of the epidemic prompted teachers to realize the necessity and importance of online teaching and acknowledging related skills.

## 2.2. Technology applications in tourism education

The landscape of hospitality and tourism higher education is altering dramatically (Kim & Jeong, 2018), enhanced by techniques. Radical transformations are essential for the sustainability of tourism education (Hsu, 2018). Information and Communication Technology is essential for tourism teaching and learning before students join the tourism industry (Adukaite et al., 2017). Active learning tools and platforms with technology, such as HOTs, clickers, and INNOUTOUR had been employed into hospitality and tourism education (Kim & Jeong, 2018). Chiao et al. (2018) constructed an online platform, named Cultural Tourism Digital Guiding Platform (CTDGP), and examined its learning effectiveness. They verified the indirect impact of interaction among people and devices concerning effectiveness.

Hsu (2012) explored the application of Web 3D simulation virtual worlds in tourism education. The application not only enhances learners' self-efficacy but also provides training related to tourism knowledge as well as communication and interpersonal skills. Liburd and Christensen (2013) pointed out that Web 2.0 can be meaningfully and effectively integrated to higher tourism education. In the context of this type of teaching and learning, students should be familiarized with the learning tools and environment gradually. Aiming to design effective and interactive learning activities, teachers should change the role of traditional experts into monitors and coaches. Social media also can be employed in learning and teaching (Liburd, J. J., & Christensen, I. M. F., 2013). With the strength of inter-activeness, joint creation of content, critical thinking and collaboration among students and teachers, online learning can provide in-depth learning.

Online learning has been recognized as the future trend of hospitality and tourism education (Kim & Jeong, 2018). It makes distance learning mode, in which students and teachers are located in different geographical regions, become a reality. The basic and fundamental information, such as concepts, knowledge and application which can be downloaded online, thus students can learn on their own (Hsu, 2018). Real interactions happen in physical classroom while blended learning is recognized and practiced across multi-disciplines. Annaraud and Singh (2017) concluded that the perceptions and enthusiasm regarding MOOCs vary among students and faculty where faculty have a deeper understanding of opportunities and challenges to developing and teaching a MOOC. What's more, AI-based or robot teaching assistants (TAs) can help teachers reduce interaction time with mass students.

Recently, virtual reality is also adopted in education and business training. Huang, Backman, Chang, et al. (2013) conducted a study supported by Second Life, an educational platform for real-world simulation, social interaction and collaborative learning, which links tourism education to virtual world (Chiao et al., 2018). Deale (2013)'s results revealed that Second Life allowed students to effectively engage with each other in the learning process. Traditional classrooms will also be obsolete. Future classrooms will have movable furniture, transparent and reconfigurable walls, expansive writing spaces (such as walls, floors, and table tops), bright colors, versatile technologies, and de-fronting designs.

## 2.3. Research design

Chinese students were on traditional winter vacation when the epidemic occurred. To reduce the infectious risk, the Chinese Ministry of Education made it clear that "Disrupted classes, Undisrupted teaching". Therefore, colleges and universities sought and took measures to carry out distance education nationwide.

The College of Tourism and Service Management of Nankai University, China has rich experience in distance teaching, MOOCs development and classroom teaching. Well-known tourism experts and scholars have been invited to launch the micro bachelor project of international culture and tourism development, which mainly aims at students, tourism practitioners and social learners who are interested in tourism discipline. With the principle of "small, simplicity and completeness", learners can use fragmented time for systematic and in-depth learning. At present, four courses have been launched within the project, namely, *China's role in global tourism*

*development, tourism policy and planning, culture and tourism, and tourism research methods.* These courses are taught in English, with Chinese and English subtitles, in this case. They have been launched on international MOOCs platforms, FutureLearn, Xuetangx and Wisdom Tree.

Therefore, the research team decided to take Nankai University's tourism education as an example to summarize the teaching methods and techniques used during the epidemic in order to provide reference for tourism education in other universities. Triangulation of interviews, newsletters review and observation is used in the current study (See Fig. 1).

Newsletters about online teaching in WeChat released subscriptions were collected and reviewed in this study. These newsletters are filled with articles, pictures and screen shots about online teaching. In-depth interview was undertaken to obtain the detailed information and perceived difficulties and benefits of online teaching. Observation was actualized by being teaching assistants, and the team members can experience the process of online learning and teaching and interacting with teachers and students.

Firstly, we summarized teaching approaches adopted by Nankai University through analyzing the newsletters published by Office of Educational Administration on WeChat. Then we used content analysis to analyze the data collected from interviewing and observation to find pros and cons of every approach. Rounds of discussion were held to reach consensus.

### 3. Finding

#### 3.1. Teaching approaches adopted by Nankai University

During the period of epidemic prevention and control, Nankai University quickly implemented a working plan to guarantee the smooth operation of teaching and learning online during the extension of school term. During the epidemic period, Nankai University mainly used three teaching methods: the first is the basic model SPOC teaching, a small private online course, which belongs to asynchronous learning; the second is the advanced model, for live online broadcasting, which is a synchronous online learning; the third is the expansion model, which refers to the use of MOOCs resources to conduct teaching online and interact in discussion section. These three teaching modes are mainly supported by online platforms such as Xuetangx, Rain classroom and Wisdom tree.

According to the survey statistics, of the total 3083 courses offered in the second semester at Nankai University, 2070 courses have adopted the SPOC online teaching method, 905 courses adopted live broadcasting teaching, and 108 courses used the resources of MOOCs to teach. The main teaching methods and platforms of the course offered at Nankai University during the epidemic period are shown in Table 1.

Since the outbreak of the COVID-19, College of Tourism and Service Management of Nankai University has implemented positive response to the call of the University, with the rich experience of online education, and it has formulated an online teaching development plan to guarantee the smooth operation of the online teaching. The college organized teachers to learn the teaching methods of "Xuetangx + Rain classroom" and "Wisdom tree" in advance, so as to better use SPOC, online live broadcast and other resources for teaching. The online teaching technical support group is responsible for the technical support and auxiliary management of online teaching, helping teachers to familiarize themselves with the functions and methods of teaching platforms, instructing teachers to learn how to use auxiliary software to assist in teaching, instructing students to use each teaching platform, and providing teachers and students with various technical support mechanism.

The college strictly controls the teaching quality to ensure online teaching is subject to the same standard as offline teaching. In consultation with the staff, the school management team establishes the three-level audit mechanism, including teacher's self-inspection, the undergraduate director, final auditing from the teaching and learning supervisory, guarantee the teaching quality. At the same time, the college has formulated the online contingency teaching plan, in view of the unexpected situation that may occur, so that it could help the teachers to launch the online teaching activities.

#### 3.2. Strengths and weaknesses of each approach

The approaches of online teaching include MOOCs, SPOC, and Live broadcast. Based on the rich and various online teaching forms, this part mainly introduces their connotation and application in tourism education.

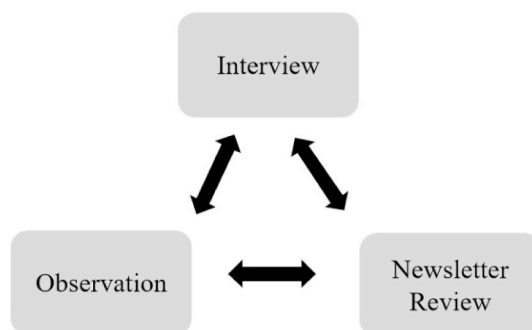


Fig. 1. Triangulation of Data sources.

**Table 1**  
Main teaching methods and platform of Nankai University.

Teaching methods	Platform	Number of courses	Percentage
SPOC (67%)	Xuetangx	1562	51%
	Wisdom Tree	475	15%
	Chaoxing and others	33	1%
Live class (29%)	Rain Class	772	25%
	Wisdom Tree	96	3%
	others (Tencent classroom, ZOOM, etc.)	37	1%
MOOC (4%)	XuetangX, Wisdom Tree	30	1%
	Chaoxing, Icourse	78	3%
Total		3083	100%

#### 4. MOOC

MOOCs (Massive Open Online Course) is an innovative educational model that allows everyone to register free of charge through the Internet. The famous MOOC platforms are Icourse, Xuetangx, Wisdom tree, Udacity, Coursera, edX, FutureLearn, Iversity and so on. According to statistics, until April 2019, 12500 MOOCs were online, more than 200 million students and social learners studied MOOCs, and 65 million students received MOOC credits.

Nankai university's first course "Global tourism development trends" is open on FutureLearn, Xuetangx and Wisdom tree. According to data provided by the FutureLearn platform, learners come from 128 countries including China, the United Kingdom, the United States, Russia, Germany, and Italy and so on, and the scale of the first round of running reaches more than 2000 people. Another course titled "Tourism Policy and Planning" was opened in January 2020 on the FutureLearn platform and Xuetangx platform. According to data of FutureLearn, 402 participants from 89 countries, including China, the United Kingdom, the United States, Russia, Germany and Italy, participated in the online study.

#### 5. SPOC

SPOC (Small Private Online Course) is a small private online course. This concept was first proposed and used by Professor Armand Fox of the University of California, Berkeley. "Small" and "Private" are relative to the "Massive" and "Open" of the MOOCs, which means that the size of the class is generally between dozens and hundreds. Private refers to the restrictive access conditions for students, and the learners who meet the specific conditions can be included in the SPOC curriculum. SPOC often adopts the method of blending learning with online learning. Teachers assign online teaching resources to students in advance for preview, and then answer students' questions in physical classroom to know the extent of learning and understanding of the students; and deal with homework or organize other teaching activities such as case study and discussion. In general, teachers can set up and control the progress to their preference, rhythm and scoring system of the curriculum according to the teaching arrangement and students' needs.

##### 5.1. Live broadcast

Live broadcast teaching is the use of live broadcast tools for online teaching, mainly including Live Text, Live Voice and Live Video, can achieve real-time interaction, in this case, all the preparatory work is needed before the live broadcast in case of poor network and other unexpected situations.

###### (1) Text

The text form of live broadcast refers to the use of text in the live broadcast platform for live sharing. Although it's easy to undertake text live broadcast, the way is single and difficult to attract students to be immersed in learning.

###### (2) Voice

With live voice broadcast, teachers do not have to face the camera directly. Teachers can mobilize students' enthusiasm through rich content and interesting interaction. At the same time, the existing teaching resources such as text materials, courseware or video can be used to assist teaching.

###### (3) Video

The scene created by live video teaching is more real and interactive. At the same time, it supports courseware sharing and screen sharing, which can create a sense of interaction between teachers and students.

Each teaching model has pros and cons (see Table 2), and teachers need to prioritize in using according to the situation and context.

Taking the "Global Tourism Development Trends" as an example, during the epidemic period, teaching team insists on "Outcome

Based Education (OBE)" as the notion to improve the ability of autonomous learning for students in an all-round way. "Rain classroom + Wisdom tree + Tencent conference + WeChat" hybrid tool (see Fig. 2) are mainly used, MOOC, SPOC and live broadcast are all involved in the teaching and learning.

Rain classroom is used to release the course notice (Fig. 3). Slides are prepared for students to preview in advance." *Global Tourism Development Trends* "has been open on the" Wisdom Tree "platform twice, with a very mature curriculum system and content. Students can study on their own with the guidance from teachers. Teachers or teaching assistants can pay attention to videos watching progress, homework completion of the students, and then provide timely supervision. Tencent conference is used for live broadcast (Fig. 4), with the purpose of achieving better interaction between teachers and students. Students are fully involved the discussion. In addition, it enables the students to present their homework with sharing screen. WeChat is mainly used for daily interaction (Fig. 5), because any problems encountered in the online learning process can be posted in WeChat for discussion and idea exchange.

## 6. Conclusion and discussion

This study takes tourism education in Nankai University as an example to illustrate the support and facilitating impact of technology on online teaching in the COVID-19 context. Instead of suspending the teaching, the disease facilitated the popularity of online teaching, enhanced the development of related techniques, and changed the perception of online teaching.

This study is based on the triangulation of interviewing, observing and newsletters and presents an overall review of the approached adapted in Nankai University and illustrates the online teaching process through case study. MOOCs, SPOC and living broadcast has its strengths and limitation (Table 2), teachers can adapt comprehensively and make the class attractive and interactive.

This disease provides an opportunity to check the development of Education Informationization to identify the dilemma and direction in future. As Kim and Jeong (2018) mentioned online learning has been recognized as the future of hospitality and tourism education. It's necessary and urging to develop more digital resources with high quality. Since 2018, the College of Tourism and Service Management has made great efforts to create a micro-credential project with four courses: "Global Tourism Development Trends", "Tourism Policy and Planning", "Culture and Tourism" and "Tourism Research Methods". In the same year, the Research and Development Center of Digital Teaching in Nankai University was set up to hold regular seminars to share MOOCs production experience, exchange ideas in teaching and learning of online courses and promote the best practices of teachers' digital teaching ability.

Knowledge sharing is also important for online teaching and learning. In order to ensure the normal operation of teaching and learning online, colleges and universities should make full use of the existing high-quality online course resources developed by leading academics and widely available and free on different platforms.

Promoting the internationalization of online tourism education is on the way. As COVID-19 spreads around the world, fighting the epidemic is no longer the responsibility of a State or States, like climate change, terrorism, refugee crises, and natural disasters. It's a common challenge that all countries of the world need to face together. The internationalization of online courses needs to be realized through platform diversification, curriculum internationalization, teacher internationalization and student internationalization. During the period of epidemic prevention and control, online education in China has become more mature and accumulated rich experience and effect, which can provide further reference for other countries in the world.

### 6.1. Limitation and future research

The present study has limitations that deserve further investigation. First, to reduce the infectious risk, we only interview teachers who stay in school during the epidemic. In the future, students and administrators can be concluded in to analyze the prons and cons from various views. Second, this study is qualitative in nature and is case specific. Further investigation can use quantitative methods to analysis the usefulness of online teaching, learning behaviors in school closures context, and even the positive psychology employed in online teaching.

**Table 2**  
Comparative analysis of the prons and cons of teaching models.

Mode	Prons	Cons
MOOC	Massive; Open; Online; 4A (Anyone, Anytime, Anyplace, Anyway); Can be viewed repeatedly.	With poor real-time
SPOC	"Blending Learning" is achieved	Small size; Weak influence; Access restrictions.
Live broadcast	Real-time; Interactive	Can't be repeated viewing; Strong adaptability is needed for teachers; Strong network fluency.

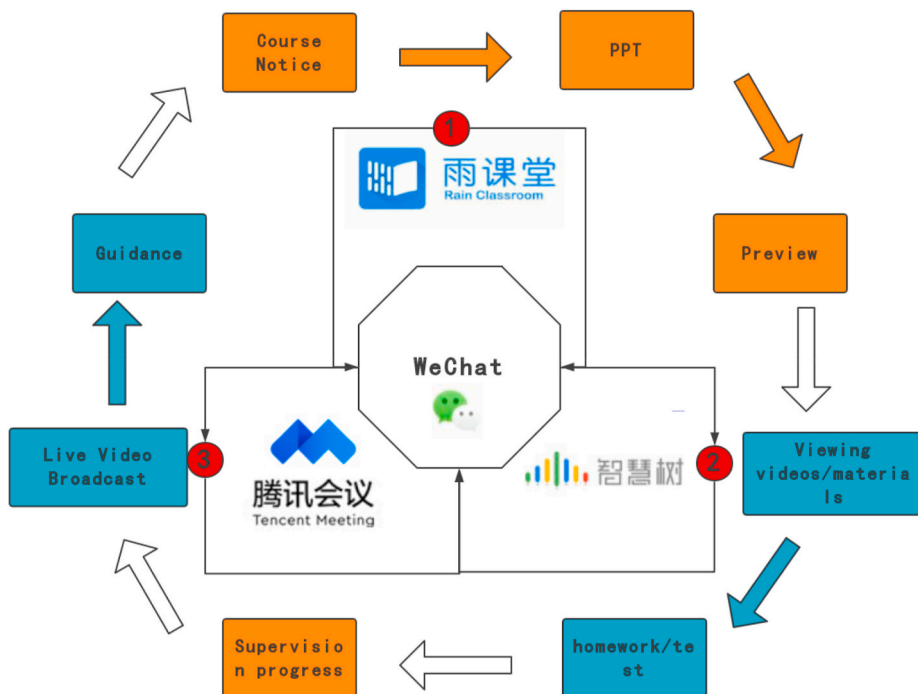


Fig. 2. Teaching tools used in the course named “Global Tourism Development Trends”.



Fig. 3. Examples of notice released with Rain classroom.





Fig. 4. Examples of presentation with Tencent conference.



Fig. 5. Examples of interaction by WeChat.

**Declaration of competing interest**

None.

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**Appendix A. Supplementary data**

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jhlste.2020.100288>.

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